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EXAMINER	
MEW, KEVIN D	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/724,957	SAWEY ET AL.	
	Examiner	Art Unit	
	Kevin Mew	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 December 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,5,7,9-12,14-18,21 and 24-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5,7,9-12,14-18,21 and 24-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

Response to Amendment

1. Applicant's Remarks/Arguments filed on 12/21/2007 have been considered. Claims 3-4, 6, 8, 13, 19-20, 22-23 have been cancelled by applicant. Claims 1, 2, 5, 7, 9-12, 14-18, 21 and 24-36 are currently pending.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 5, 7, 9-12, 14-18, 21 and 24-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Black et al. (USP 6,614,796).

Regarding claim 1, Black discloses a port acceleration apparatus (FACL switch, Fig. 4) for a fibre channel arbitrated loop (for a fiber channel arbitrated loop FCAL), the fibre channel arbitrated loop coupling a plurality of disks (connects a plurality of NL nodes/disks, col. 1, lines 14-17 and element 108, Fig. 4), the apparatus (FCAL switch) comprising:

at least one fibre channel input (learning half bridge 102, col. 14, lines 9-22) configured to receive data from the fibre channel arbitrated loop (receives data from a FCAL net, col. 14, lines 9-22);

at least one fibre channel output (learning half bridges 106, col. 14, lines 9-22) configured to send data to the fibre channel arbitrated loop (sends data to a FCAL net, col. 14, lines 9-22);

at least one device input (learning half bridge 104, col. 14, lines 9-22) configured to receive data from at least one of the disks (receives data from a NL node/disk, col. 14, lines 9-22, col. 1, lines 14-17);

at least one device output (learning half bridge port similar to port 106, col. 14, lines 9-22) configured to send data to at least one of the disks (sends data to one of the NL nodes/disk, col. 14, lines 9-22, col. 1, lines 14-17);

at least one controller (switch control circuits, elements 36, 38, 40, Fig. 3) configured to process at least one fibre channel primitive flowing in the fibre channel arbitrated loop (processes OPN primitives flowing in) to generate, based on the at least one fibre channel primitive (OPN primitives), at least one signal (to generate RDDY control signals) indicative of whether data from the at least one fibre channel input is to be routed to the at least one fibre channel output or to the at least one device output (to indicate to the cross-bar switch that the destination node has been located so as to connect the appropriate FCAL networks together to complete the conversation, col. 13, lines 33-42 and col. 15, lines 52-61); and

at least one multiplexer (port multiplexer 224, col. 34, lines 31-49) configured to route, in accordance with the at least one signal, the data received by the at least one fibre channel input to the at least one fibre channel output or to the at least one device output (to route the data between a first port and a second port in accordance with the RRDY primitive signals, col. 34, lines 31-49, col. 27, lines 22-35 and Fig. 7).

Regarding claim 2, Black discloses the apparatus of claim 1 wherein the at least one fibre channel primitive includes at least one of an ARB primitive and an OPN primitive (OPN primitive, col. 14, lines 48-52, col. 15, lines 52-61).

Regarding claim 5, Black discloses the apparatus of claim 1 wherein the at least one signal is indicative of at least one source of data to be routed to the at least one device output (control signals to indicate to the cross-bar switch that the destination node has been located so as to connect the appropriate FCAL networks together to complete the conversation, col. 13, lines 33-42).

Regarding claim 7, Black discloses the apparatus of claim 1 wherein the apparatus comprises an integrated circuit (switch control circuits 36, 38, 40, Fig. 3).

Regarding claim 9, Black discloses a method for accelerating traffic flow in a fibre channel arbitrated loop that connects a plurality of devices, the method comprising:

receiving, from the fibre channel arbitrated loop, data comprising at least one fibre channel primitive (receiving OPN primitives from FCAL, col. 13, lines 33-42, col. 15, lines 52-61);

processing the at least one fibre channel primitive (processes OPN primitives flowing in) to determine whether to route data received from the fibre channel arbitrated loop to the at least one disk or to the fibre channel arbitrated loop (to generate RDDY primitives to indicate to the cross-bar switch that the destination node/disk has been located so as to connect the appropriate

FCAL networks together to complete the conversation, col. 13, lines 33-42 and col. 15, lines 52-61 and col. 1, lines 14-17); and

routing, in accordance with the at least one signal, the data received from the fibre channel arbitrated loop back to the fibre channel arbitrated loop (routing the data between a first port and a second port in accordance with the control signals, col. 14, lines 44-52).

Regarding claim 10, Black discloses the method of claim 9 wherein the at least one fibre channel primitive includes at least one of an ARB primitive and an OPN primitive (OPN primitive, col. 14, lines 48-52, col. 15, lines 52-61).

Regarding claim 11, Black discloses the method of claim 9 further comprising routing, in accordance with the determination, data received from at least one of the devices to the fibre channel arbitrated loop (to route the data between a first port and a second port in accordance with the control signals, col. 14, lines 44-52).

Regarding claim 12, Black discloses the method of claim 9 further comprising routing, in accordance with the determination, at least one ARB primitive to the fibre channel arbitrated loop (ARB primitive is routed, col. 41, lines 25-38, col. 42, lines 37-38).

Regarding claim 14, Black discloses the method of claim 13 further comprising routing to the at least one disk, in accordance with the determination, data received from the fibre channel arbitrated loop or at least one CFW primitive (port multiplexr 224 to route the data

between a first port of a node/disk and a second port of a node/disk in accordance with the RRDY primitive signals, col. 34, lines 31-49, col. 27, lines 22-35, col. 1, lines 14-17 and Fig. 7).

Regarding claim 15, Black discloses a data routing apparatus (FCAL switch, Fig. 4) for at least one disk device (for a plurality of NL nodes/disks, col. 1, lines 14-17 and element 108, Fig. 4) associated with a data loop (with a fiber channel arbitrated loop FCAL net), the apparatus comprising:

at least one data loop input (learning half bridge 102, col. 14, lines 9-22) configured to receive data from the fibre channel arbitrated loop (receives data from a FCAL net, col. 14, lines 9-22);

at least one data loop output (learning half bridges 106, col. 14, lines 9-22) configured to send data to the fibre channel arbitrated loop (sends data to a FCAL net, col. 14, lines 9-22);

at least one controller (switch control circuits, elements 36, 38, 40, Fig. 3) configured to process at least one fibre channel primitive flowing in the fibre channel arbitrated loop (processes OPN primitives flowing in) to generate at least one signal (to generate control signals) indicative of whether data from the at least one fibre channel input is to be routed to the at least one fibre channel output (to indicate to the cross-bar switch that the destination node has been located so as to connect the appropriate FCAL networks together to complete the conversation, col. 13, lines 33-42 and col. 15, lines 52-61); and

at least one multiplexe configured to route, in accordance with the at least one signal, data received by the at least one data loop input to the at least one data loop output or the at least one disk device (port multiplexer 224 to route the data between a first port of a node/disk and a

second port of a second node/disk in accordance with the RRDY primitive signals, col. 34, lines 31-49, col. 27, lines 22-35, col. 1, lines 14-17 and Fig. 7).

Regarding claim 16, Black discloses the apparatus of claim 15 wherein the processing comprises determining whether the at least one disk device is authorized to participate in a conversation currently associated with the data loop (flow back flow control determines if the source node/disk can send data based on whether a RRDY primitive is received at the source node, which prevents from the source node/disk from transmitting until the switch is ready to stream it to destination, col. 15, lines 34-61, col. 1, lines 14-17).

Regarding claim 17, Black discloses the apparatus of claim 15 wherein the processing comprises determining whether the at least one disk device has successfully arbitrated to gain access to the data loop or is communicating with at least one other device that has successfully arbitrated to gain access to the data loop (determining whether another device on the loop has won the arbitration, col. 41, lines 25-38, col. 1, lines 14-17).

Regarding claim 18, Black discloses the apparatus of claim 15 further comprising at least one device input configured to receive data from the at least one disk device (to route the data between a first port and a second port in accordance with the control signals, col. 14, lines 44-52, col. 1, lines 14-17).

Regarding claim 21, Black discloses the apparatus of claim 15 further comprising at least one device output configured to send data from the at least one device (to route the data between a first port and a second port in accordance with the control signals, col. 14, lines 44-52).

Regarding claim 24, Black discloses the apparatus of claim 15 wherein the apparatus comprises an integrated circuit (switch control circuits 36, 38, 40, Fig. 3).

Regarding claim 25, Black discloses the apparatus of claim 15 wherein the apparatus comprises a hub (FCAL switch/intelligent hub, col. 4, lines 48-61, Fig. 4).

Regarding claim 26, Black discloses a method for routing data to at least one device associated with a data loop, the method comprising:

receiving, from the fibre channel arbitrated loop, data comprising at least one fibre channel primitive (receiving OPN primitives from FCAL, col. 13, lines 33-42, col. 15, lines 52-61);

processing the at least one fibre channel primitive (processes OPN primitives flowing in) to generate at least one signal (to generate control signals) indicative of at least one source of data to be routed to the data loop (to indicate to the cross-bar switch that the destination node has been located so as to connect the appropriate FCAL networks together to complete the conversation, col. 13, lines 33-42 and col. 15, lines 52-61); and

routing, in accordance with the at least one signal, data from the data loop back to the data loop (routing the data between a first port and a second port of the FCAL net in accordance with the control signals, col. 14, lines 44-52).

Regarding claim 27, Black discloses the method of claim 26 wherein the processing comprises determining whether the at least one device is authorized to participate in a conversation currently associated with the data loop (flow back flow control determines if the source node can send data based on whether a RRDY primitive is received at the source node, which prevents from the source node from transmitting until the switch is ready to stream it to destination, col. 15, lines 34-61).

Regarding claim 28, Black discloses the method of claim 26 wherein the processing comprises determining whether the at least one device has successfully arbitrated to gain access to the data loop or is communicating with another device that arbitrated to gain access to the data loop (source node can send data frame to the destination node when the source node receives a RRDY primitive from the destination node, col. 15, lines 52-61).

Regarding claim 29, Black discloses the method of claim 26 further comprising routing, in accordance with the at least one signal, data from the at least one device to the data loop (to route the data between a first port and a second port in accordance with the control signals, col. 14, lines 44-52).

Regarding claim 30, Black discloses the method of claim 26 further comprising routing, in accordance with the at least one signal, data used to arbitrate for access of the data loop to the data loop (comprises routing OPN primitives to arbitrate for FCAL access, col. 15, lines 52-61).

Regarding claim 31, Black discloses the method of claim 26 wherein the at least one signal is indicative of at least one source of data to be routed to the at least one device (to route the data between a first port and a second port in accordance with the control signals, col. 14, lines 44-52).

Regarding claim 32, Black discloses the method of claim 31 further comprising the step of routing to the at least one device, in accordance with the at least one signal, data from the data loop or other data (to route the data between a first port and a second port in accordance with the control signals, col. 14, lines 44-52).

Regarding claim 33, Black discloses an apparatus that communicates via a data loop, the apparatus comprising:

at least one processor (switch control circuit, elements 36, 38, 40, Fig. 3) configured to process data associated with the data loop (processes OPN primitives flowing in);

at least one data loop input (learning half bridge 102, col. 14, lines 9-22) configured to receive data from the data loop (receives data from a FCAL net, col. 14, lines 9-22);

at least one data loop output (learning half bridges 106, col. 14, lines 9-22) configured to send data to the data loop (sends data to a FCAL net, col. 14, lines 9-22);

at least one processor (switch control circuits, elements 36, 38, 40, Fig. 3) configured to process at least a portion of the data from the at least one data loop input (processes OPN primitives flowing in) to generate at least one control signal (to generate control signals)

indicative of whether data from the at least one data loop input is to be routed to the at least one processor (to indicate to the cross-bar switch that the destination node has been located so as to connect the appropriate FCAL networks together to complete the conversation, col. 13, lines 33-42 and col. 15, lines 52-61); and

at least one multiplexer configured to route, in accordance with the at least one signal, the data received by the at least data loop input to the at least one data loop output (port multiplexer 224 to route the data between a first port and a second port in accordance with the RRDY primitive signals, col. 34, lines 31-49, col. 27, lines 22-35 and Fig. 7).

Regarding claim 34, Black discloses the apparatus of claim 33 wherein, in accordance with the at least one control signal, the at least one multiplexer routes to the at least one data loop output either the data from the data loop or data from the at least one processor (port multiplexer 224 to route the data between a first port and a second port in accordance with the RRDY primitive signals, col. 34, lines 31-49, col. 27, lines 22-35 and Fig. 7).

Regarding claim 35, Black discloses the apparatus of claim 33 wherein the apparatus comprises a data storage system (routing table, element 127, Fig. 4).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Black et al. in view of Hospodor et al. (USP 6,697,914).

Regarding claim 36, Black discloses all the aspects of claim 33 above, except fails to explicitly show the apparatus of claim 33 wherein the apparatus comprises a disk-based data storage system.

However, Hospodor discloses a switched node for use in a fibre channel arbitrated loop FCAL, which comprises a disk data storage system (col. 3, lines 14-29, col. 4, lines 32-59 and Fig. 5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the FCAL switch of Black with the teaching of Hospodor in using a disk data storage system in a switched node such that the FCAL switch (apparatus) of Black will comprise a disk-based data storage system.

The motivation to do so is to use the disk storage to service the data access requests based on the scheduling data received.

Response to Arguments

4. Applicant's arguments filed on 12/21/2007 have been fully considered but are moot in view of the new ground of rejection(s).

Applicant argued on page 2, paragraphs 1 and 3 of the Remarks that Black fails to teach or suggest "at least one device output configured to send data to at least one of the disks," and "at least one controller configured … to generate, based on the at least one fibre channel primitive,

at least one signal indicative of whether data from at least one fibre channel input is to be routed to the at least one fibre channel output or to the at least one device output" as recited in claims 1 and 9, examiner respectfully disagrees. It is noted that Black discloses a FCAL switch (Fibre channel arbitrated loop switch; FACL switch is part of the fibre channel arbitrated loop) that comprises a crossbar switch and switch control circuits for switching data from a source network node to a destination network node in the arbitrated loop (col. 13, lines 33-42, col. 15, lines 52-61, col. 14, lines 9-22; source and destination network nodes are also part of the fibre channel arbitrated loop). Thus, Black teaches at least one device output (port 106, col. 14, lines 9-22) configured to send data to at least one of the disks (sends data to one of the NL nodes, col. 14, lines 9-22 and Fig. 4). In addition, Black teaches processing OPN primitives (fibre channel primitive) and generating control/ready signals indicative of whether it is ready to be routed data from the source node to the destination node (at least one signal indicative of whether data from at least one fibre channel input is to be routed to the at least one fibre channel output or to the at least one device output, col. 13, lines 33-42, col. 15, lines 52-61). Thus, Black teaches "at least one controller configured ... to generate, based on the at least one fibre channel primitive, at least one signal indicative of whether data from at least one fibre channel input is to be routed to the at least one fibre channel output or to the at least one device output."

Applicant further argued on page 3, paragraphs 1 and 2 of the Remarks that Black does not disclose "a primitive which routes data from a fibre channel arbitrated loop to the same fibre channel arbitrated loop," examiner respectfully disagrees for two reasons. First, Black teaches processing OPN primitives (fibre channel primitive) and generating control/ready signals indicative of whether it is ready to route data from the source node to the destination node (at

least one signal indicative of whether data from at least one fibre channel input is to be routed to the at least one fibre channel output or to the at least one device output, col. 13, lines 33-42, col. 15, lines 52-61). Second, it is interpreted the source network node and the destination network node are part of the arbitrated loop and therefore, Black teaches routing data from a source network node of a fibre channel arbitrated loop to the destination network node of the same fibre channel arbitrated loop (source node and destination node can occur on the same FCAL, col. 16, lines 51-57).

In response to applicant's argument on page 4, paragraph 1 of the Remarks that Blck does not teach or suggest "routing, in accordance with the at least one signal, data from the data loop back to the data loop," a new ground of rejection is made (see rejection above).

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Mew whose telephone number is 571-272-3141. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham, can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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3/26/08